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MARYLAND ENTOMOLOGICAL SOCIETY

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The purpose of the Maryland Entomological Society, which was formed in November, 1971, is to promote the science of entomology in all its branches, to provide a meeting place for professional and amatuer entomologists residing in Maryland, the District of Columbia, Virginia, Pennsylvania and Delaware, to issue a periodical and other publications dealing with entomology, and to facilitate the exchange of ideas and information through its meetings and publications.

Membership in the Society is open to all persons interested in the study of entomology. All members receive the Maryland Entomologist and monthly newsletters and/or announcements of meetings. Institutions may subscribe to the Maryland Entomologist but may not become members. Prospective members should send to the Treasurer full dues for the current year, together with their full name, address, telephone number, and special entomological interests.

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Back issues of the Maryland Entomological Society Newsletter (Vols. 1,2,& 3 - 8 nos. each) and the Maryland Entomologist are available, to members, from the Treasurer. The M.E.S. Newsletters are .25¢ per no. and the Maryland Entomologist is $1.00 per copy.

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The Maryland Entomological Society is a non-profit, scientific organization. Meetings are held on the third Friday of every month (from October to May) at 8:00 p.m., in room 403 of the Biological Sciences Building, University of Maryland Baltimore County.

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Cover illustration: The logo of the Maryland Entomological Society features the Maryland Shield and a specimen of Euphydryas phaeton (Drury), the Baltimore Checkerspot, which became the official insect for the state of Maryland through the efforts of many of the members of this Society.

BUTTERFLIES HILLTOPPING ON SUGARLOAF MOUNTAIN

John H. Fales

A collecting trip was made to middle Maryland on May 29, 1979 in company with William R. Grooms. Fog occurred early, but it became clear with a high temperature of 77° F. We collected in Montgomery Co., and then drove north into Frederick Co. We arrived at the gate to Sugarloaf Mountain at 2:22 P.M. This is a prominent quartzite monadnock with forests of oak and hickory in the southeastern area of the county. It rises to an elevation of 1282 feet, which is about 800 feet above the surrounding Piedmont plain. We started up the trail toward the summit from the Fourth View parking lot. During the next 30 minutes the butterflies were scarce, although a single Erynnis icelus was collected. Also observed were several specimens of Papilio glaucus glaucus, Papilio troilus troilus and Graphium marcellus. However, on arriving at the nearly flat summit, we suddenly were aware that the air was filled with butterflies. They were very active and continually flew after each other all over the summit. The species seen and collected were: Amblyscirtes vialis (Edw.) roadside skipper, Erynnis icelus (Scud.& Bur.) dreamy dusky wing, Epargyreus clarus clarus (Cram.) silverspotted skipper, Battus philenor philenor (L.) pipevine swallowtail, Papilio glaucus glaucus L. tiger swallowtail, Papilio troilus troilus L. spicebush swallowtail, Graphium marcellus (Cram.) zebra swallowtail, Celastrina argiolus pseudargiolus (Bdv.& LeC.) spring azure, Limenitis arthemis astyanax (Fabr.) red spotted purple, Nymphalis antiopa antiopa (L.) mourning cloak and Polygonia comma (Harris) comma.

This was a perfect example of the hilltopping behavior of butterflies and this isolated mountain was an ideal situation for its occurrence. The writer previously reported on an observation of hilltopping on the Coastal Plain in southern Maryland (Maryland Entomologist, 1978, 1(2):10).

J.H.F., 2809 Ridge Road, Huntingtown, Md. 20639

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INSECT ILLUSTRATION

Elaine R. S. Hodges

In the effort to communicate information to others about natural science, illustrations amplify words. The subject lies before the reader with little room for misinterpretation, if the drawing is done well. In entomology, especially in taxonomic papers, drawings can be used to magnify tiny structures, correct distortion, reconstruct broken parts, show overlapping layers in detail, clarify anatomy, and eliminate dirt.

Accuracy is the first consideration in scientific insect illustration. A pretty but inaccurate drawing is useless for scientists and misleading for the public. To insure the required accuracy, the scientist should check all aspects of a drawing thoroughly, because even an experienced illustrator occasionally makes mistakes and can misinterpret or miss parts.

Rough but proportional drawing

Achieving this accuracy is done, not by drawing freehand, but by producing a measured or optically traced rough drawing that has true proportions. A simple and inexpensive method is to use a grid in the microscope ocular plus one on paper. What is seen in squares in the ocular is drawn in corresponding squares on the paper. Different-sized squares on papers produce differing sizes of drawings. To avoid having squares show on the finished illustration, draw on tracing paper placed over the grid.

Optical instruments often used are the camera lucida and, for slide-mounted specimens, the microprojector. The camera lucida usually fits between the stereo or compound microscope oculars and objectives and on one side has a prism reflecting a mirror. On the table under the mirror is drawing paper. To avoid distortion of the image, the microscope and the drawing surface must be parallel; if the drawing surface is slanted, the microscope should sit sturdily on that same slant, or both should be on a flat surface. When you look through the microscope oculars with the camera lucida attached, you see simultaneously the specimen with both eyes and the drawing paper and pencil with one eye -- three images with two eyes. The image is not really projected onto the paper; it cannot

be seen without looking through the microscope. By tracing around the insect's apparent image on the paper, you produce an accurately proportioned rough drawing. Changing objective (not ocular) magnification changes the size of the image. Wild and Nikon make camera lucidae, but some older models that fit on an ocular are occasionally available at less cost.

A microprojector is an upside-down compound microscope, with light coming from above, passing through a slide-mounted specimen, the objectives and then, optionally, through an ocular down onto a drawing surface. Size of the projected image can be adjusted by raising and lowering the drawing surface, or changing microscope objective and/or ocular magnification. The image is clearly visible on the drawing surface and is traced. A relatively inexpensive microprojector is the Bausch & Lomb Tri-Simplex.

With any optical instrument and the ocular grid, drawings should be made only of the image in the center two-thirds of the field of view. The outer third is distorted by lens curvature: spherical aberration. Always record the magnification used, and place a scale on the drawing for future reference.

Size of the drawing is determined by the size of the publication and the amount of detail to be shown. Generally, one-third reduction works well-- the printed version will be two-thirds the size of the original. Up to fifty percent reduction -- and even more -- can be satisfactory if lines are thick enough and sufficient space is left between lines and dots so that they do not run together. For fifty percent reduction, maintain white space between dots and lines at least equal to the diameter of adjacent dots or lines. However, very large drawings take longer to produce, are bulky to mail and handle, and their detail may be lost in great reduction, invalidating one reason for making a large drawing, i.e., to show detail. It is best to avoid planning a size that will require more than fifty percent reduction. Some printers prefer to reproduce halftones one-to-one (same size as original) or at less than one-third reduction.

If the rough drawing done from the camera lucida or microprojector is not the right size, it can be enlarged or reduced by a grid system or with an opaque projector, also called the "Lazy Lucy." This instrument is used by commercial artists. An enlarging or reducing xerox or photostat machine can be used also.

Whether the rough drawing is done on the final drawing surface or on an intermediate paper, frequently tracing paper, is determined by the eventual rendering technique. Pen and ink can be applied over a pencil drawing on bristol board or can trace the drawing onto vellum or plastic film. For a halftone technique, plan to trace or transfer the detailed pencil drawing onto another, final surface, which will be clean and undamaged as a result. Insect illustration supplies in general include tracing paper (for rough drawings, cover sheets, etc.), kneaded rubber erasers, soft pencil-style multilith erasers, and, of course, sharply pointed pencils.

Detailing

After the rough, measured drawing is completed, its detailing is completed from the microscope. Nuances of texture and shape, the tiniest hairs and structures, as well as anatomic connections and layers must be studied and recorded. Much of the rough drawing may be erased and changed slightly while basic proportions are maintained. The detail that is important in a scientific drawing often is not visible with optical projection techniques. This is why it is important to go over every aspect of the rough drawing from the microscope at magnifications higher than was possible when recording basic proportions.

If possible, turn the specimen and study it from several angles. Reverse dry microscope slides, balancing them on two pennies to keep the cover slip off the microscope stage, and study the back of the specimen. Change lighting levels and angles. Study additional specimens. These efforts help in the understanding of structures and their relationships.

Keep in mind that insects are constructed like telescoping cylinders connected by flexible membranes. Even the genitalia follow this basic pattern. Projections are often small, perhaps flattened, cylinders sitting on larger cylinders. Judge whether double lines at edges delineate the thickness of a body wall (and therefore might be shown as one thick line) or represent two separate anatomic edges. Watch out for artifacts, distorted or torn parts and dirt that look like structures. Do not draw too many fine lines to represent folds of membrane; these can become confused with venation or striation, depending on their location.

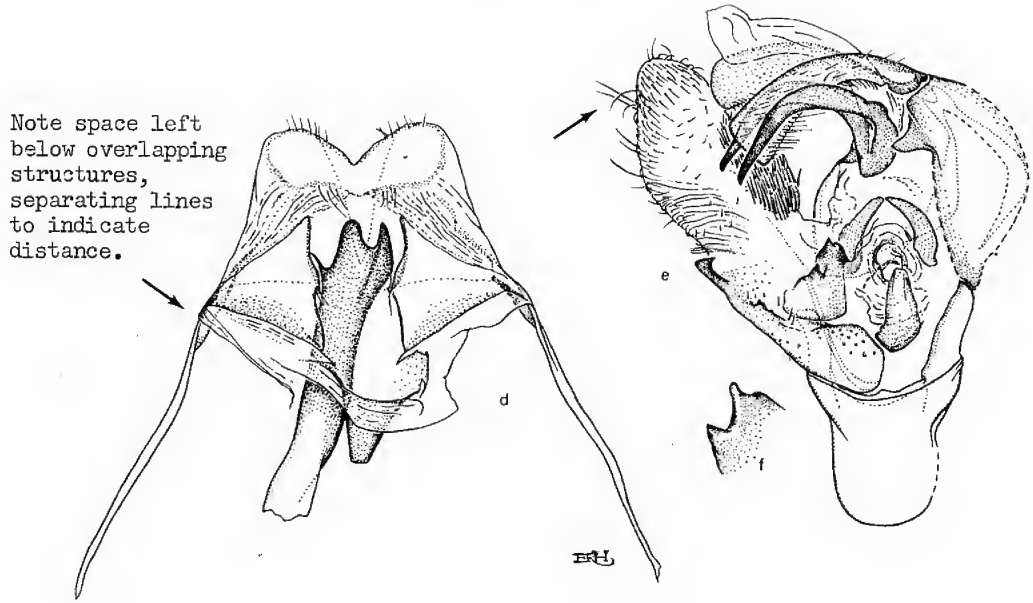

Fig. 1. Line drawing, pen and ink on bristol board. Dotted lines indicate underlying structures. Dashed lines represent reconstruction of broken parts. An enlargement (f) clarifies the structure of one small part at base of valve of (e), male genitalia of Pachyliodes resumens. The female eighth abdominal segment and base of ductus bursa of P. resumens is (d). From Fascicle 21, Sphingoidea, Fig.14, by Ronald W. Hodges, The Moths of America North of Mexico, 1971.

The illustrator's detailed drawing, covered by tracing paper, is checked by the scientist. This tracing paper can be used to indicate corrections and questions as well as to protect the drawing. After corrections are made, final rendering can be started.

Rendering

Most insect illustrations are line drawings rendered in pen and ink. This is the most dependable medium for successful reproduction in print. Whether the journal's paper is soft or hard, coated or uncoated, whatever printing process or quality is used, line drawings usually reproduce well, as long as black ink is used and drawings are not made too large. Grayed ink or more than fifty percent reduction can result in disappearing lines and detail. Halftone drawings -- pencil, carbon dust, wash (gray watercolor, diluted ink), some coquille board techniques -- reproduce best if printed on glossy, coated paper and with minimal reduction.

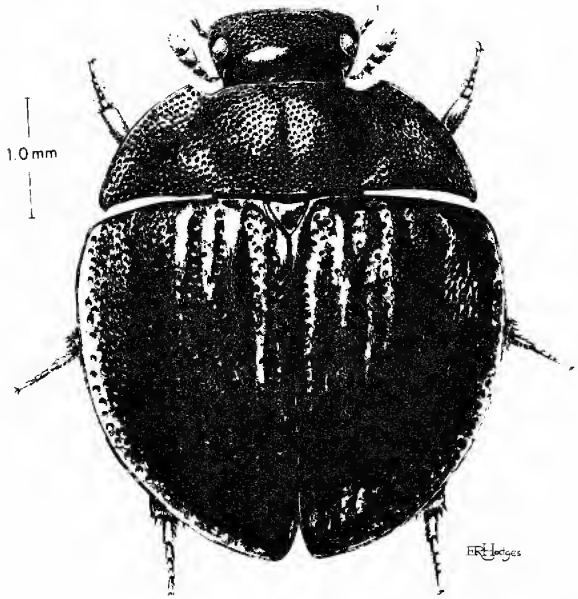

Fig. 2. Tone drawing, carbon dust on coated board. Use of a drawing board coated with material like plaster (available commercially for medical illustrations) permits scratching of highlights and white hairs. Kruia chrysopelma Spangler & Perkins, Hydrophilidae, is a new African genus described by Paul Spangler in Pan Pacific Entomologist, January, 1981.

Photographs are halftones. Halftone reproduction requires that the camera photograph the drawing through a screen, breaking the drawing photographically into little black dots, bigger in blacker parts of the illustration, smaller in gray parts. This results in the effect of varied tones of gray with no true black or white. The "white" background will appear pale gray from the tiny dots created by the screen, unless special masks are cut by the printer or artist to create photographically a truly white background. Halftone techniques can make a drawing look most like the specimen by producing a photographic effect. But, how the drawing will be printed should be considered before embarking on a halftone. It is best not to combine line and halftone techniques on the same page, because this costs more to print, usually.

For pen and ink drawings, the following supplies are useful:

Pens - technical pens or "dip" types: Experimentation with brands of technical pens and dip or crowquill-type nibs will determine what suits each person best. Nibs have different characteristics: e.g., Hunt 104 - firm, Gillotte 659 - flexible, but both produce fine lines. Different nibs may require different holders.

Ink - waterproof India ink: technical pens will require an India ink designed to flow readily.

Surfaces - two-ply bristol board, plate (shiny) finish, or plastic films, vellum, or frosted acetate for tracing drawings.

Erasers - The electric eraser is invaluable for corrections on paper. It leaves bristol board smoother than when untouched. Soft red or white eraser plugs are less abrasive than gray ones. For plastic films, special plastic erasers are available. Kneaded rubber erasers are good for erasing pencil lines after inking is complete and dry.

X-acto knife or other sharp blade - for making corrections on plastic film, scratching white lines over dark areas on plastics, cleaning crowquill nibs.

"White-out" paint and brush - Use artist's white (Pro-white, Dr. Martin's, etc.) for corrections, not those designed for typing errors. A very small watercolor brush, 5-0, is most useful.

Pens should be kept clean. If technical pens are not in continuous use, they should be emptied and cleaned or kept in a humidifier of some sort. Minimally, they should be cleaned biweekly. Dip pens should be wiped clean with lint-free materials such as a wet chamois whenever ink is depleted in the nib and before the pen is dipped in ink or ink applied with a dropper. Dip the pen so that ink reaches only half-way up the nib, or use a dropper to fill the nib. After each refilling and before applying pen to paper, always test the pen on a scrap of the same paper to insure that no lint on the nib will spoil the line.

Halftone techniques are many and too complex to permit even a brief listing of supplies here. To learn some of these techniques, it would be best to contact a professional scientific illustrator or the Guild of Natural Science Illustrators, P.O. Box 652, Washington, D.C. 20044. Some scientific or medical illustration books give directions for these rendering techniques.

If several separate drawings must be arranged together on a plate, this can be planned in advance by tracing the pencil drawings, which have been taped into the proper composition, in ink onto a large sheet of translucent material like Mylar, frosted acetate, or vellum. Halftone drawings should be rendered in final arrangement after the detailed drawings have been transferred or traced onto the rendering surface, because any cut marks, edges, or tape will show in the photography and are expensive to hide.

Mounting, labeling, protection

Drawings should be mounted securely on board for protection. Inked drawings on bristol board can be waxed, rubber cemented, or taped to the board. Rubber cement will stain yellow eventually through the bristol board or paper. Translucent materials with inked drawings can be taped into position on the mounting board with transparent tape. Drawings that are to be reproduced in line, i.e., black and white, will be photographed with film that picks up primarily black/white and therefore will not show, for the most part, cut edges, tape, etc. In addition, these imperfections can be "opaqued" out on the negative because the background will be pure white; anything covered with black (or red) on the negative will print white on the positive (journal publication).

After the drawing is mounted, labeling may be necessary, dependent on the rules of the journal. Professional-looking labeling results from use of "transfer type" or cut-out letters. The former can be rubbed into position, but sometimes it cracks and comes off; it should not be covered with acetate because static electricity hastens the lifting off of these letters. Good brands of transfer type are Geotype, Chartpak, available at college book stores, art stores, and some other outlets. The cut-out lettering, Formatt brand, is more durable than the rub-off type, will not crack or lift off, but may take a little longer to apply, and its transparent edges may show in halftones, mostly on black backgrounds. It does come with a white background in a black circle that shows up quite well on photographic prints. Careful burnishing of the edges will make them more transparent. Cover the plates with bond, brown Kraft, or strong tracing paper, taped on the back of the board.

Before sending out the illustrations, make a good xerox copy or photograph as a record and insurance in case of loss or damage. The one time copies are not retained will be the time the illustrations are lost. To help prevent loss, label the back of the board with the author's name and address, instructions to return the illustrations, and the name of the manuscript and journal. (Some printers handle several scientific journals.) Protect mounted drawings for shipping with heavy cardboard on both sides. If corrugated board is used, alternate the directions of the

corrugations to strengthen the package.

Suggestions given here are meant to help the author with drawings that he or she must do. However, for most efficient use of time, and usually for best results, a scientific illustrator should be employed. To save time and money, remember that much visual information can be conveyed in simple diagrammatic drawings, often more effectively than with elaborate drawings. A good illustrator can make a simple drawing esthetic as well as informative and accurate.

Acknowledgements

I thank Ronald W. Hodges, my husband, for his review and improvement of this manuscript, and Bob Bryant for his patience in waiting for it. Paul J. Spangler, Smithsonian Institution, kindly permitted use of Fig. 2 in this paper.

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VARIATIONS IN THE OCCURRENCE OF SWAMP BUTTERFLIES BETWEEN CENTRAL MARYLAND AND NORTHERN VIRGINIA

Richard H. Smith, Jr.

Having collected butterflies enthusiastically in the Baltimore, Md. area from 1965 to 1971 and in northern Virginia from 1973 to 1978, I had the opportunity to observe any butterfly population differences which might exist between these two geographically similar areas. The areas are only separated by roughly 50 miles and have similar terrain, elevation, and ratio of woodland to developed area. Therefore, I would not have expected to notice any profound differences in butterfly populations. It is my observation, however, that certain swamp butterfly species do show distinct population changes as we cross from one area to the other.

One species showing particular sensitivity is Poanes massasoit (Scudder), a small swamp skipper. Despite the fact that it is locally common north of Washington, D.C., I have searched in vain for it many times in swampy areas south of the Potomac River. Covell (1967), in fact, reports that massasoit has not been recorded in Virginia. Similar distributional peculiarities hold for other swamp butterflies as follows:

Euphydryas phaeton (Drury) - locally common in the Baltimore, Md. area; only two known recent records for northern Virginia (Field Season Summary for 1975) and William D. Hartgroves (pers. comm.)

Boloria selene myrina (Cramer) - occurring locally north of Washington, D.C. (Andersen and Simmons, 1979); absent in northern Virginia but occurring locally in mountainous areas in western Virginia (Clark and Clark, 1951)

Lycaena hyllus (Cramer) - occurring locally just north of the Potomac River (Fales and Grooms, 1980); the only reported Virginia record known to me is for Poverty Hollow near Blacksburg (Field Season Summary for 1978)

Polites mystic (Scudder) - occurring locally northwest of Baltimore, Md.; absent in northern Virginia but occurring locally in some mountainous areas in western Virginia (Clark and Clark, loc. cit.)

Euphyes conspicua (Edwards) - often coexisting with massasoit and locally common north of Washington, D.C.; absent in northern Virginia but occurring locally in some mountainous areas in western Virginia (Clark and Clark, loc. cit.)

To explain such distributional trends, we may simply alude to the fact that most of these species are typified as northern (Howe, 1975). Therefore, only slight differences in average temperature and daylight, when moving southward, can lead to the gradual disappearance of foodplant, environment, and butterfly species. However, it would seem that the abrupt distributional changes noted above would require some more specific causes. My conjecture, which is based more on occasional observations than on geological records and butterfly life histories, is that the population trends are due to soil differences and the need by these species of permanently wet swamps.

The soil in central Maryland appears to be comparatively sandy, porous, and water absorbent. Thus, underground water flows are more likely to reach the surface producing open springs and swampy areas. In addition, rainfall is more likely to be absorbed deeply into the soil, thereby prolonging swampy conditions during summer dry spells. I have found many of the above species in permanently swampy habitats in central Maryland. In contrast to Maryland soil, northern Virginia soil appears mostly clay-like and weakly permeable. This inhibits the formation of surface springs from underground water flows. Swampy areas do appear in lowlands during rainy periods and remain for several weeks because of poor soil permeability. However, such areas frequently dry up completely in summer for several days and few, if any, remain permanently swampy. The life histories of the species cited may depend upon permanently swampy conditions to proceed normally, but northern Virginia soil properties do not generally provide this feature. The possible dependency of these species on permanently swampy conditions should be thoroughly checked experimentally. Such effects would serve to illustrate the fact that many insect species are sensitive indicators of slight variations in our environment.

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COLLECTING APHIDS FROM WALNUTS AND HICKORIES THROUGH THE YEARS

Theodore L. Bissell

Hickories and walnuts constitute the plant family Juglandaceae in North America. The principal cultivated species are pecan, actually a hickory, Carya illinoensis Koch., and English walnut, Juglans regia L.

My interest in aphids on these trees started in 1925 when Dr. A.L. Quaintance, U.S. Bureau of Entomology, sent me to southern Georgia to conduct investigations on pecan insect pests. There were several species of Lepidoptera and Coleoptera to deal with, and he suggested a sideline study of the Phylloxera. However, a new pest appeared at that time, the black pecan aphid, Melanocallis caryaefoliae (Davis), which caused leaf spotting and defoliation. There were also two yellow species on pecan, the blackmargined aphid, Monellia caryella (Fitch), and a blackspotted species, Monelliopsis nigropunctata (Granovsky), which had already been

recognized under different names.

I soon found that these all occurred also on several species of wild hickory: mockernut, Carya tomentosa Nutt.; pignut, C. glabra Sweet; sand hickory, C. pallida (Ashe); and water hickory, C. aquatica Nutt. Shortly, another species was found on pignut and mockernut which was later described as Monellia microsetosa by W.R. Richards of Canada. This aphid is pale yellow with gray margins similar to the blackmargined species but is marked by six bright yellow internal spots, which unfortunately fade away when the aphid is preserved. I have thought the spots merely ornamental; a young biology student recently asked if the spots will ward off predators -- something to look into.

A few lines as to the methods of collecting aphids: These insects always take their nourishment from plants, hence the common name of "plant lice." My way is to look over a tree, pick off infested leaves, put them in polyethylene bags with labels, and take them home for study under the microscope. In hot weather, one must protect the bags from direct sunlight. Under the scope the species and life stages are separated. The leaves will remain fresh long enough to support the aphids about a week, giving time for immatures to develop into adults. Some of the immatures as well as the sexual forms should be preserved. All are put into ethanol until they can be cleared and mounted. For permanent mounts, Canada balsam is usually used.

Other collectors sweep plants with a heavy net or beat the foliage and catch aphids on a sheet or pan, putting them, at once, into ethanol.

Still another way is to let aphids fly into bright yellow cake pans filled with water. My old friend, Mort Leonard (1964 & 1965), by operating pans on the roof of an apartment house in Washington, D.C., for two summers collected about 1,250 aphids representing 57 species, 11 of these making new records for the District. The rooftop was 200 feet above ground. A wooded park was nearby but all the aphids were not inhabitants of trees.

Aphids are also collected on sticky boards, either on the ground, which gives data regarding crop infesting species, or extended from aircraft (Glick, 1939) to record the heights attained by arthropods carried upward by air currents.

In 1947 I moved from Georgia to my home state of Maryland to engage in extension entomology under the direction of Dr. E. Cory, and aphid collecting became incidental to other work. But in 1965 I resumed aphid studies in earnest. That year I went to Salem, New York, north of Albany, to the old stamping ground of Dr. Asa Fitch, the first state entomologist in America. He studied pest species and nonpest species and in 1855 began a series of 14 annual reports on the insects of New York. These were published by the State Agricultural Society. The first report (1855) contains a description of "the little hickory aphis," Aphis caryella, noting, "Their wings are not elevated in the usual steeply inclined manner but are laid flat upon the back, in a horizontal direction ..." The genus Monellia was later described on this flat-winged condition which is uncommon in aphids. The common name has been changed to blackmargined aphid.

There are plenty of hickories at Salem (shagbarks and bitternuts, Carya ovata Koch. and Carya cordiformis Koch., respectively) and I soon found caryella as well as other yellow aphids I knew in Georgia and Maryland. There was also the leaf spotting black pecan aphid, which Fitch missed.

I also located Asa's handsome mansion and nearby laboratory, the Battenkill mentioned by him (kill means river), and finally Fitch's grave with his familiar likeness engraved on the stone, in the town cemetery designed by him. I visited Dr. Athelbert Abbott who gave me a reprint of Fitch's Early History of the Town of Salem, and he told me of Fitch's extensive genealogical records which had gone unpublished.

Then from Salem I went to the New York State Museum in Albany where J.A. Wilcox, interested in gallerucine beetles, showed me a drawer of Fitch's insect specimens, including a number of aphids on card points, very neatly labeled, specimens then one hundred or more years old.

Westward from Albany is the town of Downsville and near it Pepecton Reservoir on the Delaware River. Near it I found a tremendous bitternut tree, trunk over three feet through, but no aphids at that time.

In all I went to New York three years, in June, July and August, to observe the significant color development in the different aphids.

In Maryland I have collected at College Park, at the Plant Introduction Station in Glenn Dale, and at the 4-H Camp in Garrett County, westernmost part of the state. At Glenn Dale there are both pecans and shagbark hickories, planted some 60 years ago by C.A. Reed and other horticulturists, which generally have plenty of aphids. Nearby is

Marietta Estate, home of Gabriel Duvall, lawyer friend of Washington, Jefferson, and Madison. Here are four giant pecans, 100 feet tall and three to four feet in diameter, which are believed to have been the gift of Thomas Jefferson. A great admirer of the tree, he got nuts from New Orleans and Illinois and planted them at Monticello. (See Betts, 1944.)

At the 4-H Camp is a grove of shagbark hickories growing in their native element and they usually bear an abundance of aphids. One of these I shall describe as new; I have found it in six other states and eastern Canada.

In the District of Columbia is the National Arboretum, a truly great place for trees and aphids. On hickories there I have found two species to describe (1978), Protopterocallis gigantea and P. quadrata.

Other states I have collected in include: California, Arkansas, Ohio, Pennsylvania, Virginia, North Carolina, and South Carolina. In California I visited the San Fransisco Bay area where William M. Davidson studied walnut aphids and published on them nearly 70 years ago, and also at Los Angeles County Arboretum where Harry G. Walker has made probably 5,000 aphid collections from countless numbers of plants and who has sent me many specimens. Robert C. Dickson of Riverside, California, has sent me slides. When I visited him, he showed me aphids on Mexican walnut and took me exploring on the high desert of Mohave. In Arkansas men from the University took me to the Ben Lomond area in the southwestern corner of the state, where we found the nutmeg hickory, and another undescribed aphid. In Pennsylvania, John Pepper has helped me. He has collected and published for 40 years and makes the finest balsam mounts I know.

I must acknowledge the help of George F. Knowlton of Utah State University for collecting aphids from walnut and pecan from some 40 localities in all parts of his state. Utah has no native walnut trees but the eastern black walnut was introduced by pioneers long ago and pecan and English walnuts were also planted. Then the aphids from east and west found the trees in Utah!

I have collected a few aphids at Ottawa, Canada, where W.R. Richards is located. He has helped me with his numerous publications, suggestions, and specimens from his large collection.

In North Carolina, Clyde F. Smith of State University, Raleigh, took me collecting at Cliffs of Neuse State Park. Down the steep bank to the Neuse River's edge I found a single water hickory and again, Monellia caryella. With Carol Parron as junior author, Clyde published (1978) their monumental list of North American aphids, 1,380 species. We will not soon run out of material to study.

A number of other specialists have helped me materially in recent years: Louise Russell and her successor, Manya Stoetzel, at the USDA Laboratory at Beltsville, Maryland, have charge of the great national collection of aphids and have opened it for my use. Also Henry L.G. Stroyan, Plant Pathology Laboratory, Harpenden, England, whom I have visited twice, took me on a most enjoyable trip to Cambridge, England. Three other aphidologists I visited at the British Museum for Natural History in London are Victor F. Eastop, John P. Doncaster, and Roger Blackman. Roger distinguishes himself by counting chromosomes in aphid embryos and thus showing group affinities. I have helped him collect in this country. There was also Dick Hille Ris Lamber of Bennekom, The Netherlands, who has advised me on certain aphid structures. I had a pleasant and profitable visit at his home in 1980.

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REARING SWALLOWTAIL BUTTERFLIES FOR OBTAINING ICHNEUMON PARASITOIDS OF THE GENUS TROGUS

Robert T. Mitchell

Some respondents to my request in a recent Maryland Entomologist for specimens of Trogus have inquired about techniques for collecting and rearing swallowtail larvae to obtain the parasitoids. I am therefore offering some suggestions in this issue.

Finding the larvae, of course, is the first step. The black swallowtail, Papilio polyxenes Fabr., is the species most commonly found since the larvae occur in the nearby vegetable garden, feeding on carrots, parsnips, parsley and other umbelliferous plants. With greater effort they may be found in vacant lots, fields, and roadsides where wild carrot, Daucus carota L., also called Queen Anne's lace, grows. Other swallowtails that feed primarily on Umbelliferae, with the larvae resembling those of the black swallowtail, are the old world swallowtail, P. machaon L., of northern Canada and Alaska, anise swallowtail, P. zelicaon Lucas, of the western mountain and Pacific Coast states and provinces, indra swallowtail, P. indra Reak., of the western states, and the short-tailed swallowtail, P. brevicauda Saund., of the Gaspé Peninsula, Nova Scotia and Newfoundland. Some western species of this "old world" swallowtail group feed on species of Artemisia (wormwood).

The presence of some swallowtail larvae is revealed by rolled edges of the leaves in which the larva rests on a silken mat. As it grows, the greater part of, or an entire leaf, is rolled. This activity is characteristic of the spicebush swallowtail, P. troilus L., on spicebush, Lindera benzoin (L.), and sassafras, Sassafras albidum (Nutt.), in our eastern states. Similar in appearance to the spicebush swallowtail is palamedes, P. palamedes Drury, of the coastal southeast. It feeds on sweet bay, Magnolia virginiana L., and red bay, Persea borbonia Spreng. They both have large eye spot markings on swollen thoracic segments.

Members of the tiger swallowtail group may also be hiders. They have smaller eye spots than those of the spicebush group. Eastern tiger, P. glaucus L., larvae are found most commonly on wild cherry and other members of the genus Prunus, and on tulip tree, Liriodendron tulipifera L. Well-grown larvae are easier to find on the latter food plant. Where a few long conspicuous unconsumed leaf stems occur on the same twig, a larva may be seen on a silken mat on a whole or partly consumed leaf nearby. Western tigers, P. rutulus Lucas, feed mainly on willows, Salix spp., cottonwoods and aspens, Populus spp., while the pale swallowtail, P. eurymedon Lucas, of the west coast mountain ranges, feeds mainly on buckthorn, Rhamnus spp. The two-tailed, P. multicaudata Kirby, feeds chiefly on Rosaceae, especially choke cherry, and occurs in many western and coastal states.

Caterpillars of the zebra swallowtail, Graphium marcellus (Cram.), are shaped like those of the spicebush and tiger groups, but they have no eye spots, being ringed with colored bands. They are exposed most of their lives on pawpaw, Asimina triloba Dunal, and occur east of the Mississippi Valley.

The shiny dark brown, tentacled larva of the pipevine swallowtail, Battus philenor (L.), feeds almost entirely on pipevines, Aristolochia spp. No Trogus is recorded on this species, but in 1940, I collected some mature larvae at Wooster, Ohio, that pupated and then remained unattended for three weeks or so. When finally observed, three of them had typical Trogus emergence holes. Eggs are laid in batches, so if you locate one, be sure to look around for brothers and sisters.

In the citrus zone, the larva of the giant swallowtail, P. cresphontes Cram., is called the orange dog, but it feeds on all kinds of citrus. Elsewhere this species accepts such plants as prickly ash, Zanthoxylum americanum Mill., hercules club, Zanthoxylum clava-herculis L., and hop tree, Ptelea trifoliata L. So far, no Trogus has been reared from this species.

No Trogus has been recorded on the tailless swallowtails, Parnassius spp., which feed on sedum at high altitudes. This is not surprising, however, for besides occurring in an environment that people rarely frequent, as related to me by Dr. Karolis Bagdonas, an expert on the butterflies of the Rocky Mountains, the larvae are extremely hard to find, since they hide during the day in litter on the ground.

Illustrations of mature larvae of many of the swallowtail species can be found in Mitchell and Zim's Golden Guide, Butterflies and Moths.

A clue to the whereabouts of larvae can be obtained from watching adults. A butterfly that seems to be interested in a non-flowering plant may be laying eggs. Observe where. For testing your rearing ability

collect an egg or two, but before leaving the immediate area examine nearby plants of the same species chosen by the female for more eggs or for larvae that have hatched from eggs laid previously by this or other females. About two weeks later, or when your test caterpillars are 8-10 mm. long, return to the area to collect parasitized ones. The more time that elapses the easier it will be to find the larvae because of their larger size, but the longer you wait the fewer there will be to find, because disease, birds, predacious insects, weather, etc., continue to decrease their number.

Tightly closed 1-lb. coffee cans or 1-qt. freezer boxes are very convenient for rearing larvae to maturity, and these can be stacked to save space, but I prefer transparent freezer bags sealed with ties. In these three types of containers leaves will stay fresh for several days and, if kept out of direct sunlight, or high temperatures, mold will not be a problem as long as they are cleaned regularly. With freezer bags the need for replenishing food or for cleaning can be determined and the growth of the larvae can be observed without opening them. A bag can easily be cleaned by merely turning it inside out. In order to save space I hang the bags on ropes like clothes.

When the larvae are small, several of them can be kept in smaller containers, but larger larvae, especially those in the last instar, should be confined individually. As a larva reaches maturity, an inclined stick should be placed in the container to provide a favorable pupation site. These sticks with the chrysalids attached can then be taped to the inside of a 42-oz. rolled oats box. Being deep and round and amply large the butterflies can emerge and spread their wings without damage. The chrysalids are visible through a nylon stocking stretched over the open top. A rubber band holds the stocking tight and serves also to hold the excess material of the leg and foot twisted and tucked under it. When a butterfly or Trogus emerges, the leg and toe portion is withdrawn and held upright, where, when the specimen flies in, it can be captured.

Remember that while butterfly rearing is fun, it can and should also be a scientific venture. There is still much to learn about the biologies of even some fairly common butterflies, so do keep good field records of your activity. When Trogus is involved and you have material to submit to me, I hope that you can provide the locality information, including habitat, and the date on which it was taken. If it was reared, I would appreciate that same information about the host larva, plus its species, size, food plant, and date of pupation. Also, I would like to know the date of Trogus emergence. All over-wintering chrysalids should be kept under natural conditions, for emergence dates are meaningless when pupae are kept indoors.

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THE SPHINX MOTHS OF MARYLAND

Robert S. Bryant

The large and quite often colorful moths of the family Sphingidae have been special favorites of mine since the day when I "caught" my first one by taking it away from a hungry catbird, sans head and antenna, but otherwise in fairly good condition. During the intervening 26 years, I have managed to garner 25 of the approximately 45 species that should eventually be recorded for Maryland. In preparation for this paper I have been in contact with numerous resident and ex resident collectors, about half of whom have generously made their data available to me. Consequently, seven additional species have been added to the list.

The importance of keeping accurate data on any material collected cannot be emphasized too strongly. During the course of gathering my information for this report, a large number of species were mentioned with incomplete data and had to be omitted. But, as three of these constituted

new state records, I shall mention them here and hope that when additional material is obtained it will be published at a later date.

Manduca rustica (Fabricius) -- specimen collected by Dr. Robert S. Simmons in western Maryland.
Sphinx chersis (Hubner) -- specimen collected by Mrs. Alan Franklin.
Sphinx eremitus (Hubner) -- larva on mint collected by Dr. Raymond Nagle in Howard Co.
Hodges (1971) also reports it from the suburbs of Washington, D.C.

There are several other species that, due to their scarcity, deserve comment.

Sphinx franckii Neumoegen, has long been touted as one of North America's rarest sphingids. It is the dream of every serious hawk-moth collector to someday own a specimen, yet few collectors are ever fortunate enough to achieve this goal. In spite of its general rarity, Maryland is one of the few states where one might expect to find an occasional specimen and until about twenty years ago Baltimore was known as a hot spot of franckii activity. This was due, in part, to the fact that several Baltimore specimens found their way into some of the world's most notable collections. During the last two decades, multiple captures in other states (especially South Carolina, Mississippi, and Kentucky) have diminished some of the interest in Md. franckii although I still get occasional requests for specimens or information.

For a number of years following the description of franckii in 1893, it was thought to be a hybrid between Sphinx chersis and Sphinx kalmiae (George Franck, in letter to Dr. Karl Jordan, Nov. 9, 1901) or between S. chersis and Ceratomia amyntor (Smyth:1912). The current feeling is that it is a valid species. All of the Maryland specimens, where adequate data was preserved, were taken in either the Baltimore or Washington suburbs. These specimens are given in detail, in the list of other Maryland species. In addition, the following specimens with incomplete data are known -

1 specimen from Baltimore now in Munich, Germany
1 male from Baltimore (June) now in USNM
1 male from Baltimore now in Carnegie Museum, Pittsburg, Pa.

Several other specimens were collected by Franklin H. Chermock at street lights and store windows on Liberty Road, Baltimore Co., prior to 1963. That locality has been irrevocably buried under acres of concrete and asphalt during the past fifteen years.

Xylophanes tersa (L.), though infrequently encountered, is usually present in small numbers toward the end of summer. It is considered a southern migrant but it seems possible, in mild winters, that a few pupae may be able to overwinter in Maryland soil. I refer to the extremely early capture of a specimen at Beltsville in Prince Georges Co. by Mr. John Fales on May 31, 1960. Most specimens have been taken at light or on the flowers of summer phlox.

Another apparent rarity is Eumorpha achemon (Drury). I have one specimen of this striking moth taken 22 years ago, a few blocks from my home on the SW boundary of Baltimore City. Only one other specimen has been reported, which is surprising. The food plant is grape and as both wild and cultivated varieties are abundant in Maryland, the moth should be taken from time to time.

Undoubtedly Maryland's prettiest sphingid, and my personal favorite, is Darapsa versicolor (Harris). No dead cabinet specimen can compare with the delicate, almost haunting beauty of the living moth. It too, unfortunately, is seldom collected and my 1969 specimen from Loch Raven is the only one recorded thus far. I saw another one in the same place the following year but it had been crushed on the sidewalk by some careless passer-by.

One other species is worthy of mention in view of the few records turned in. Agrius cingulatus (Fabricius), which is common in the southern states and Central America, is occasionally collected in Maryland. Hodges (1971) feels it is a resident species only as far north as South Carolina. I have seen it in small numbers in Ocean City on store windows and feeding at petunias in porch boxes and flower gardens. The presence of a number of individuals, in good condition, seems to indicate that they were not part of a migration but matured somewhere in the vicinity. Since this species has been recorded from Nova Scotia as early as July, it is reasonable to assume that some moths may enter Maryland in June and that eggs laid by the migrating females, then give rise to one or more broods of Md. bred adults. It should be expected to occur, with some regularity, in the southern counties and on the Eastern Shore where the

sandy soil is conducive to the growing of sweet potatos, the food plant of cingulatus.

Sphingids are, generally speaking, fairly easy to collect since their habits bring them into close contact with man. Most of them are attracted to man's incandescent, flourescent, and mercury-vapor light implacements on all-night gas stations, phone booths, bill boards and street lights. Even more effective as a light source, from the collectors standpoint, are the ultra violet lamps or "black lights" manufactured by several companies. Of these, the 15-watt BL T8 and BLB T8 give the best results (Pfrimmer, 1955). These small portable units are excellent for sampling rural areas where normal lighting is scarce or non-existent.

Many of the larger species may be caught while nectaring at deep-throated flowers such as trumpet vine, morning glories, petunias and honey suckle, while at least five of the smaller species may be trapped by using the conventional fruit bait (Bryant, 1978). Even a few artificial chemical baits have proved partially successful specifically isoamylsalicylate and methyl benzoate in alcohol for A. cingulatus and phenylacetaldehyde in alcohol for S. eremitus (Howe, in litt.).

Though identifying females can be a bit difficult, especially for the tyro, sphingids may be bred and reared as easily as the silk moths. Most females will oviposit readily when confined in a medium sized cylindrical cage of nylon mosquito netting, especially if sprigs of the food plant are present. The larvae present no special rearing problems, provided they are not crowded. Overcrowding tends to cause restlessness and the caudal horns of many larvae are damaged by being bitten by roaming siblings. Such horn damage always causes loss of hemolymph and in extreme cases may cause deformity through difficulties encountered during ecdysis.

Mature larvae pupate on or in the ground and if a box containing 3 or 4 inches of moist sand and peatmoss is provided for this purpose, perfect, healthy pupae are usually the result. Any pupae which fail to eclose at the normal time should not be discarded without careful examination. I have had several Ceratomia amyntor (Geyer) pupae overwinter two years. C.H. Fernald (1886) is the only author I have read who mentions this phenomenon in regard to the Sphingidae, though it has often been recorded for various species of the Saturniidae.

I would like to point out another interesting feature contained in Fernald's paper on The Sphingidae of New England. He thoughtfully provided sylabification and accent marks for every latin name. This simple procedure, which takes very little extra space and time, is of immeasurable help to those of us who do not have a background in latin and, if practiced by current authors, would help to standardize pronunciations throughout the scientific community.

The following list, of approximately 500 entries, contains the 29 remaining species, not mentioned above. Although 15 of the 23 counties are represented by at least one specimen, it will be evident that the majority of records are from the central portion of the state; i.e., from Baltimore Co. in the north to St. Marys Co. in the south. Considerably more collecting needs to be done in the eastern and western counties. The list is arranged alphabetically by county and these are capitalized to make them more noticeable. It is hoped that members having material not mentioned here, or upon collecting additional species in the future, will report them to the author or otherwise make their data known. The initials following the dates, in most cases, indicate the collector and/or the present location of the specimen. For explanation of initials, consult the acknowledgements section.

Agrius cingulatus (Fabricius) -- BALTIMORE Co.: Ten Hills, VIII-61(RSB). ST. MARYS Co.: Lexington Park, 17-IX-73(JHF) & 4-X-73 & 11-X-75(PJK) all 3 collected by J.Haliscak, & 7-X-73 & 12-X-73(JPH). WORCESTER Co.: Ocean City, VII-58(RSB).

Manduca sexta (Linnaeus) -- ANNE ARUNDEL Co.: Annapolis, 21-VII-78(WTH). BALTIMORE Co.: Baltimore, 20-VIII-47(WAA). Loch Raven, 1,4,6-VIII-69 & 17-VI & 27-VII-70(RSB). Lutherville, 14-VIII-61(WAA). Owings Mills, 20-VIII-64(BDW). Ten Hills, 17-VI-69 & 21-VIII-73(RSB). CALVERT Co.: Plum Point, 13 & 25-VIII-59 & 27-VII-75(JHF). CARROLL Co.: Finksburg, 22-VIII-73(RSB). PRINCE GEORGES Co.: Beltsville, 3 to 30-VI & 18-VII to 6-IX-60 & 6,14,29-VI-62(JHF). ST. MARYS Co.; Lexington Park, 6-VIII-73 & 9-VIII-75(JPH).

Manduca quinquemaculata (Haworth) -- ANNE ARUNDEL Co.: Annapolis, (WTH). BALTIMORE Co.: Catonsville-UMBC, (PJK). Loch Raven, 1-VIII-69 & 22-VI & 16-VII-70(RSB), 19-VIII-62(WAA). Owings Mills, 13-VI-67 (BDW). CALVERT Co.: Plum Point, 15 & 19-VIII & 5-IX-59(JHF). CARROLL Co.: Reese, 3-VIII(RSB). PRINCE GEORGES Co.: Beltsville, 15-VI-43 & 30-V-62 & 7-VI to 5-VII & 12-VII to 6-IX-60(JHF).

ST. MARYS Co.: Lexington Park, 9-VIII-75(JPH). county unknown: Ivy Neck, 1-VIII-70(BDW).

Manduca jasminearum (Guerin) -- ALLEGANY Co.: Flintstone, 1-VIII-62(RSB) collected by F.H.Chermock. ANNE ARUNDEL Co.: Annapolis, 11-VII-79 (WTH). BALTIMORE Co.: Loch Raven, 6 & 23-VII-70(RSB). Lutherville, 4-VIII-61(WAA). Moncton, 15-VII-65(WAA). ST. MARYS Co.: Lexington Park, 11-VIII-75(JPH).

Dolba hyloeus (Drury) -- ANNE ARUNDEL Co.: Crownsville, (WTH). ST. MARYS Co.: Lexington Park, 19-VIII-73(JPH).

Ceratomia amyntor (Geyer) -- ANNE ARUNDEL Co.: Annapolis, (WTH). BALTIMORE Co.: Catonsville-UMBC, (PJK). Lutherville, 16-VII-70 & VII-77 (RSB) collected by W.A.Andersen. Ten Hills, VII-54 & 21-VI-66 & 3 & 23-VI-70(RSB). CALVERT Co.: Plum Point, 9-VII-75(JHF). ST. MARYS Co.: Lexington Park, 3 & 5-VII-74(JPH).

Ceratomia undulosa (Walker) -- ANNE ARUNDEL Co.: Annapolis, 8-VI & 28-VII-79(WTH). BALTIMORE Co.: Catonsville-UMBC, (PJK). Loch Raven, 25-VII-61(WAA), 4 & 7-VIII-69 & 11-VI & 6 & 23-VII-70 & 12 & 26-VII-71(RSB). Lutherville, 1-VII-63 & 23-V-78(WAA). Patapsco State Park, 2-VI-79(PJK). Stevenson, 25-VII-65(RSB). Ten Hills, 15-VIII-72 & 13-VI-73 & 12-VI-76(RSB). CALVERT Co.: Plum Point, 30-VIII-59 & 31-V-75(JHF). ST. MARYS Co.: Lexington Park, 14-VI-74 (JPH).

Ceratomia catalpae (Boisduval) -- ANNE ARUNDEL Co.: Annapolis, (WTH). BALTIMORE Co.: Baltimore, 19-VIII-47(WAA). Catonsville-UMBC, ex larva eclosed 26-VII-70(RSB). Owings Mills, 20-VIII-64 & 14-VIII-68 & 4-VII-71(BDW). Ten Hills, VIII-56(RSB). MONTGOMERY Co.: Woodside, 15-VIII-45(JHF). PRINCE GEORGES Co.: Beltsville, 19-V to 14-VI & 15-VII to 24-VIII-60(JHF). ST. MARYS Co.: Lexington Park, 10-X-75 (PJK) collected by J.Haliscak, & 20-VIII-75(JPH). Oaks, 5-IX-74(RSB) collected by W.A.Andersen.

Paratrea plebeja (Fabricius) -- ANNE ARUNDEL Co.: Annapolis, 27-V & 2-VII-79(WTH). BALTIMORE Co.: Baltimore, 19-VIII-47(WAA). Owings Mills, 22-VI-65(BDW). Ten Hills, VII-54 & VIII-60(RSB). CALVERT Co.: Plum Point, 28 & 29-VIII & 5-IX-59 & 31-V & 2-VI-75(JHF).

Sphinx franckii Neumoegen -- (1 male & 1 female) Baltimore, 14-VII-04 ex Rothschild collection-now in British Museum of Natural History; (1 male) Baltimore, 14-VII-04 ex B.P.Clark collection-now in Carnegie Museum; (1 female) Md., 9-VII-11 ex B.P.Clark collection-now in British Museum of Natural History; (1 male) Baltimore, 2-IX-58 ex W.Sieker collection-leg. F.H.Chermock-now in Rene Lichy collection, Paris, France; (1 female) Baltimore, VI-08 now in U.S. National Museum; (1 female) MONTGOMERY Co.: Kensington, 1971 collected by R.Nagle-specimen not preserved; Washington,D.C., 31-V-02.

Sphinx kalmiae J.E.Smith -- ALLEGANY Co.: Flintstone, 1-VIII-62(RSB) collected by F.H.Chermock. ANNE ARUNDEL Co.: Annapolis, (WTH). BALTIMORE Co.: Catonsville-UMBC, 25-VII-73(PJK). Lutherville, 6-VIII-62 (WAA). McDonough, VII-58(RSB). CALVERT Co.: Plum Point, 2-VI & 12-VIII-75(JHF). ST. MARYS Co.: Lexington Park, 9-VII-75(JPH).

Lapara coniferarum (J.E.Smith) -- ALLEGANY Co.: Flintstone, 1-VIII-62(RSB) collected by F.H.Chermock. ANNE ARUNDEL Co.: Annapolis, 26 & 28-VII-79(WTH). BALTIMORE Co.: Loch Raven, 4-VIII-69 & 23 & 27-VII-70 & 9-VIII-71(RSB). Lutherville, 16-VIII-61(WAA). Owings Mills, 4-VII-71(BDW). Ten Hills, 12-VIII-64(RSB). CALVERT Co.: Plum Point, 17-VIII-74(JHF). ST. MARYS Co.: Lexington Park, 11-VIII-74 (JPH).

Smerinthus jamaicensis (Drury) -- ANNE ARUNDEL Co.: Annapolis, (WTH). BALTIMORE Co.: Eklo, 5-VIII-47(WAA). Lutherville, 6-VIII-62(WAA). Ten Hills, 21-VI-77(PJK) collected by A.P.Platt. PRINCE GEORGES Co.: Beltsville, 30-VI & 1-VII & 5 & 10-VIII-60(JHF). ST. MARYS Co.: Lexington Park, 19-VIII-73 & 14-VI & 11-VIII-74 & 28-VII-75(JPH).

Paonias excaecatus (J.E.Smith) -- ANNE ARUNDEL Co.: Annapolis, (WTH). Crownsville, 1950(JHF) collected by W.G.Bodenstein. BALTIMORE Co.: Loch Raven, 17-VIII-61 & 8-VIII-62(WAA), 1,4,6,7-VIII-69 & 2,6, 23-VII-70 & 28-VI-71(RSB). Lutherville, 3-VII-70(WAA). McDonough, VII-58(RSB). Patapsco State Park, 2-VI-79(PJK). Ten Hills, 24-VI-73 (RSB). CALVERT Co.: Plum Point, 16-VIII-75(JHF). CARROLL Co.: Reese, 28-VII-72(RSB). PRINCE GEORGES Co.: Beltsville, 27-V-43 & 2 & 15-VI & 17-VIII-60(JHF). ST. MARYS Co.: Lexington Park, 11-VIII-74 & 14-VIII-75(JPH).

Paonias myops (J.E.Smith) -- ANNE ARUNDEL Co.: Annapolis, 15-VI-78 & 2-VII-79(WTH). BALTIMORE Co.: Baltimore, 21-VIII-47(WAA). Catonsville-UMBC, 8 & 16-VIII-73(PJK). Loch Raven, 4-VIII-69 & 11 & 17-VI-70 & 26-VII-71(RSB). Lutherville, 3 & 12-VIII-61 & 21-VIII-62 (WAA). Patapsco State Park, 8-V-76(PJK). Ten Hills, 27-VII-68 &

4-VI-71(RSB) & 7-VIII-81(RSB). CALVERT Co.: Plum Point, 23-VIII & 5-IX-59 & 1 & 7-VI-75(JHF). CARROLL Co.: Eldersburg, 2-VI-79(PJK). Marriottsville, 24-VI-69(RSB). MONTGOMERY Co.: Woodside, 20-VIII-46 (JHF). PRINCE GEORGES Co.: Beltsville, 1-VI to 11-VII & 21-VII to 22-VIII-60(JHF). ST. MARYS Co.: Dameron, 25-VI-74(JPH). Lexington Park, 14-VI-74(JPH). Oaks, 23-VIII-73(RSB) collected by W.A.Andersen

Paonias astylus (Drury) -- CHARLES Co.: Waldorf, 20-IX-72(JPH). PRINCE GEORGES Co.: Beltsville, 29-VI & 11-VII & 5-VIII-60(JHF). ST. MARYS Co.: Park Hall, 28-VII-81(RSB) collected by H.Orduna.

Cressonia juglandis (J.E.Smith) -- ALLEGANY Co.: Sideling Hill, 10-VII-78 (PJK). ANNE ARUNDEL Co.: Annapolis, 11-VII-79(WTH). BALTIMORE Co.: Eklo, 15-VI-50(WAA). McDonough, VII-58(RSB). Ten Hills, VI-53 & 25-VI-69 & 30-VII-71 & 22-V-73(RSB). CARROLL Co.: Marriottsville, 24-VI-69(RSB).

Hemaris thysbe (Fabricius) -- ALLEGANY Co.: Green Ridge State Forest, 20-IV-77 & 4-V-74(PJK), 9-V-63 & 19-V-66(RSB) collected by W.A. Andersen, 7-V-70 & 11 & 13-V-72 & 27-IV-74(RSB). BALTIMORE Co.: Baltimore, 23-VIII-48(WAA). Ten Hills, 23-V & 9,16,17-VIII-69 & 17-VII-70 & 1 & 5-VIII-71(RSB). PRINCE GEORGES Co.: Hall, 15-VIII-68 (WAA). WASHINGTON Co.: Woodmont, 2-V-68(WAA), 7-V-70 & 6-V-72 & 30-IV-77(RSB).

Hemaris diffinis (Boisduval) -- BALTIMORE Co.: Catonsville-UMBC, 31-VII-73 (PJK). Curtis Bay, 29-IV-70(WAA). Lutherville, 5-IX-59 & 20-VIII-66 (WAA). Owings Mills, 2-IV-70(BDW). Stevenson, 28-VIII-69(RSB). Ten Hills, 16-VII & 9,11,16,18-VIII-69 & 15 & 17-VII & 13-IX-70 & 12-VIII-71(RSB). CALVERT Co.: Breezy Point, 30-VIII-75(JHF). Plum Point, 5-IX-59(JHF). CARROLL Co.: Reese, 30-VII-66(RSB). CHARLES Co.: Allens Fresh, 5-VIII-72(RSB). CECIL Co.: Bay View, 25-VIII-66 (WAA). ST. MARYS Co.: Lexington Park, 30-VI-74 & 11 & 30-VI & 20-VII-75 & 5-IV-76(JPH). Ridge, 15-IV-59(WAA). WORCESTER Co.: Unionville, 21-IV-66(WAA).

Eumorpha pandorus (Hubner) -- ALLEGANY Co.: Flintstone, 1-VIII-62(RSB) collected by F.H.Chermock, 10-VII-78(PJK). ANNE ARUNDEL Co.: Annapolis, 21-VII-78 & 28-VII-79(WTH). BALTIMORE Co.: Baynesville, 26-VII-61(WAA). Lutherville, 3-VIII-61(WAA). Owings Mills, 5-VII-71 (BDW). Ten Hills, VIII-56 & VII-57(RSB). CALVERT Co.: Plum Point, 6-IX-59 & 1 & 3-VII & 8-VIII-75(JHF). MONTGOMERY Co.: Silver Spring, 12-VII-33(JHF). Woodside, 20-VII-46(JHF). PRINCE GEORGES Co.: Beltsville, 5 & 19-VII & 1,12,17,18,22-VIII-60(JHF). ST. MARYS Co.: Lexington Park, 30-VI-74(JPH). Patuxent River Naval Air Station, 11-VIII-74(JPH).

Eumorpha achemon (Drury) -- BALTIMORE Co.: Ten Hills, VII-59(RSB). ST. MARYS Co.: Lexington Park, 22-V-76(JPH).

Darapsa versicolor (Harris) -- BALTIMORE Co.: Loch Raven, 23-VI-69 & 2-VII-70(RSB).

Darapsa myron (Cramer) -- ANNE ARUNDEL Co.: Annapolis, 8-VI-79(WTH). BALTIMORE Co.: Baltimore, 21-VIII-47 & 30-VII-61(WAA). Loch Raven, 12-VIII-61(WAA), 23-VI-69 & 5-VI & 6-VII-70 & 28-VI & 12 & 26-VII-71 (RSB). Ten Hills, 19-VIII-69 & 16-VIII-72 & 8-VIII-75(RSB). CALVERT Co.: Plum Point, 13 & 23-VIII-59 & 26-VII & 16-VIII-75(JHF). CARROLL Co.: Eldersburg, 2-VI-79(PJK). PRINCE GEORGES Co.: Beltsville, 7-VIII-76(JHF). ST. MARYS Co.: Lexington Park, 14 & 30-VI-74 (JPH). WICOMICO Co.: Fruitland, 17-VIII-76(RSB) collected by W.A. Andersen.

Darapsa pholus (Cramer) -- ALLEGANY Co.: Flintstone, 1-VIII-62(RSB) collected by F.H.Chermock. ANNE ARUNDEL Co.: Annapolis, 12-V-79(WTH). BALTIMORE Co.: Catonsville-UMBC, 8-VIII-73(PJK). Loch Raven, 12-VIII-61(WAA), 4-VIII-69 & 27-VII-70 & 20-VI & 22-VII-71(RSB). Ten Hills, 29-VII-72(RSB). PRINCE GEORGES Co.: Beltsville, 20-V & 21-VI & 25 & 26-VII & 1 & 5-VIII-60(JHF). ST. MARYS Co.: Lexington Park, 15-VI-74(JPH).

Sphecodina abbottii (Swainson) -- ANNE ARUNDEL Co.: Annapolis, 12-V-79 (WTH). BALTIMORE Co.: Catonsville-UMBC, 6 & 30-VI-72(PJK), 9-VI-70 (RSB). Gwynn Oak, 24-V-66(RSB) collected by F.H.Chermock. Loch Raven, 20-V-62(WAA). Ten Hills, 5-V-80(RSB). Timonium, 24-V-77(WAA). ST. MARYS Co.: Lexington Park, 11-VI-76(JPH).

Deidamia inscripta (Harris) -- ALLEGANY Co.: Green Ridge State Forest, 5-V-60(WAA). ANNE ARUNDEL Co.: Ft. Meade, 11-VI-79(WTH). BALTIMORE Co.: Lutherville, 13-VI-63(WAA). McDonough, IV-53(RSB). PRINCE GEORGES Co.: Beltsville, 23-V-66(JHF). WASHINGTON Co.: Greenbrier State Park, 17-IV-77(RSB). Pearre, 1-V-69(WAA). Sideling Hill, 20-IV-77(PJK).

Amphion nessus (Cramer) -- ALLEGANY Co.: Green Ridge State Forest, 14-V-75 (PJK). ANNE ARUNDEL Co.: Annapolis, 14-VI-79(WTH), 29-IV-80(PJK).

BALTIMORE Co.: Catonsville-UMBC, 27-VI-70(WAA), 7,9,15,17,22-VI & 1-VII-70(RSB), 10-VIII-73(PJK). Prettyboy Reservoir, 28-V-59 & 6-VI-57(WAA). Ten Hills, 13 & 15-VI & 2-VII-70 & 18-V-72(RSB). DORCHESTER Co.: Henrys Crossroads, 10-VI-65(WAA). PRINCE GEORGES Co.: Beltsville, 30-VI-67(JHF). WASHINGTON Co.: Exline, 2-V-62(WAA). Pearre, 1-V-69(WAA). Woodmont, 2-V-62(WAA).

Xylophanes tersa (Linnaeus) -- ANNE ARUNDEL Co.: Annapolis, (WTH). BALTIMORE Co.: Ten Hills, VIII-55(RSB). CALVERT Co.: Plum Point, 2-IX-59 & 3-VII-75(JHF). PRINCE GEORGES Co.: Beltsville, 31-V-60(JHF). ST. MARYS Co.: Lexington Park, 10-X-75(PJK) collected by J.Haliscak & 31-VIII-71 & 12-VIII-75(JPH). county unknown: Ivy Neck, 15-VIII-68 (BDW).

Hyles lineata (Fabricius) -- ANNE ARUNDEL Co.: Annapolis, ex larva eclosed 16-V-79(WTH). BALTIMORE Co.: Eklo, 6-VIII-47(WAA). Ten Hills, VI-55 & V-56 & VI-60(RSB). GARRETT Co.: Avilton, 11-VIII-66(WAA). PRINCE GEORGES Co.: Beltsville, 11-V-49 & 19,24,31-V & 15-IX-60 & 4-VI-62 (JHF). ST. MARYS Co.: Huntersville, 27-VII-61(WAA).

Acknowledgements

I would like to express my appreciation to Dr. Bryant Mather of Clinton, Mississippi for allowing me to read a rough draft of his unpublished manuscript documenting over 200 captures of Sphinx franckii and for allowing me to use the data pertaining to Maryland. I also owe a debt of gratitude to Mr. John H. Fales of Huntingtown, Md. for contributing an immense amount of data culled from his notes on light trap captures over an entire season at Beltsville. Special thanks also go to Dr. William A. Andersen of Lutherville, Md., Mr. Jonathan P. Haliscak of Lexington Park, Md., Mr. William T. Hopkins, Jr. of Shadyside, Md., Mr. Philip J. Kean of Baltimore, Md., and Mr. Benjamin D. Williams, III of Groton, Massachusetts for graciously taking time to review their collections and for answering my inquiry concerning their Md. sphingid captures.

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R.S.B., 522 Old Orchard Road, Baltimore, Md. 21229

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THE BUTTERFLIES OF SOLDIERS DELIGHT, BALTIMORE COUNTY, MARYLAND

Richard H. Smith, Jr.

Having a generous supply of free time and interest in natural history, but little cash for gasoline between 1969 and 1971, I decided to undertake a regular study of the butterflies in the nearby Soldiers Delight area of Baltimore County, Maryland. This area, which covers roughly 2000 acres between Owings Mills and Liberty Reservoir, represents a geologically unique condition known as a serpentine barren. Botanists have long recognized this area for the many unusual plant species which are able to thrive in the barren's thin and shaly soil (Worthley, 1964 and

Vincett, 1970). Therefore, I hoped to find, and was able to confirm, eventually, that the insect life in this location was also unusual. I visited the area almost weekly during the springs and summers of the above three-year period and recorded the butterfly species I encountered during each trip. The following is my final list of species observed, adult appearance times, and notable nectar sources. The species I consider local oddities are noted.

Amblyscirtes vialis (Edwards) -- late May, on blackberry (Rubus spp.)
*Atrytonopsis hianna (Scudder) -- late May to early June, on blackberry and blue-eyed grass (Sisyrinchium spp.)
Poanes hobomok (Harris) -- late May to early June, at woods edges, on blackberry
Atrytone delaware (Edwards) -- mid-July, on milkweed (Asclepias spp.)
Atalopedes campestris (Boisduval) -- early September
Pompeius verna (Edwards) -- late June to mid-July
Wallengrenia egeremet (Scudder) -- late June to mid-July
Polites coras (Cramer) -- late May to late June, late July to early Sept.
Polites themistocles (Latreille) -- late May to late June, late July to early September
Polites origines (Fabricius) -- mid to late June
*Hesperia metea Scudder -- early to late May, on moss phlox (Phlox subulata Linnaeus)
*Hesperia leonardus Harris -- early September, on blazing star (Liatrus spp.)
Ancyloxypha numitor (Fabricius) -- late May to mid-June, late July, early to late September
Nastra lherminier (Latreille) -- mid-June, late July, late September
Pholisora catullus (Fabricius) -- mid to late May, mid-July
Pyrgus communis (Grote) -- late May
Erynnis icelus (Scudder & Burgess) -- early May to mid-June, on blueberry (Vaccinium spp.) and blackberry
Erynnis brizo (Boisduval & LeConte) -- early May, on blueberry
*Erynnis martialis (Scudder) -- early to late May, late July, on blueberry and blackberry (in May)
Erynnis horatius (Scudder & Burgess) -- early May, mid-July, on blueberry (in May)
Erynnis juvenalis (Fabricius) -- early May to early June, on blueberry and blackberry
Thorybes bathyllus (Smith) -- late May to late June, mid-July, on blackberry
Thorybes pylades (Scudder) -- early to mid-June
Achalarus lyciades (Geyer) -- late May to late June
Epargyreus clarus (Cramer) -- early May to late June, mid to late July
Papilio polyxenes asterius Stoll -- early May, early to mid-June, on moss phlox (in May)
Papilio glaucus Linnaeus -- early May to mid-June, mid-July to early September, on moss phlox (in May)
Papilio troilus Linnaeus -- early May to late June, late July to early September, on moss phlox (in May)
Pieris rapae (Linnaeus) -- early May, early to late June, late July
Colias eurytheme Boisduval -- early May
Colias philodice Godart -- early May to late June, early September
Eurema lisa Boisduval & LeConte -- late July, early to late September
Anthocaris midea Hubner -- early May
Satyrium calanus falacer (Godart) -- mid to late June, on indian hemp (Apocynum cannabinum Linnaeus)
*Satyrium edwardsii (Saunders) -- late June to mid-July
Callophrys augustinus croesioides (Scudder) -- early May, on huckleberry (Gaylussacia spp.)
Callophrys niphon (Hubner) -- early May to early June, on field chickweed (Cerastium arvense Linnaeus)
Strymon melinus humuli (Harris) -- early to late May
Everes comyntas (Godart) -- early May to late July, early September
Celastrina argiolus pseudargiolus (Boisduval & LeConte) -- early May, early to mid-June, mid-July
Limenitis astyanax (Fabricius) -- late May to early June, early September
Limenitis archippus (Cramer) -- mid to late July, late September
Cynthia virginiensis (Drury) -- early May to late July
Polygonia interrogationis (Fabricius) -- mid-June
Polygonia comma (Harris) -- early June
Phyciodes tharos (Drury) -- early May to late July, early to late Sept.
Speyeria cybele (Fabricius) -- early June to early September
Euptoieta claudia (Cramer) -- mid-July

Danaus plexippus (Linnaeus) -- early July, early to late September
Euptychia cymela (Cramer) -- early June to late July
Cercyonis pegala f. alope (Fabricius) -- late June to early September

*local species

Since many of these species are difficult to find in general, it was pleasing to discover that they all inhabit an area of easy access to naturalists in the Baltimore-Washington area. Recent visits by the author and others have confirmed that the above species still reside at Soldiers Delight. We are indeed fortunate that this area, which is now a state park, has been preserved in spite of surrounding development over the past few decades.

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R.H.S., 5213 Eliot's Oak Rd., Columbia, Md. 21044

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MARYLAND'S MOST COMMON APHIDS

Theodore L. Bissell

The best known aphid in Maryland, at least to the non-farming population, is the "rose aphid" but there are many species that infest roses. Cynthia Westcott in The Gardener's Bug Book, lists fourteen!

In our List of Aphids in the District of Columbia, Maryland and Virginia, Dr. Mort Leonard and I give 183 species known in Maryland in 1970. The page space devoted to each one, made up of reports from many sources and our own collecting, is now taken as a measure of the prevalence over the years. Such accumulation of records is influenced by the importance or popularity of the food plants; aphids on non-cultivated plants or weeds usually go unnoticed. Bias from the writer's interest in hickories and walnuts and to another's interest in poplar galls has been avoided.

The list was intended to stop at ten most common species but three tied for tenth place.

List space (cm)	Scientific Name	Common Name	Food Plants
98	Myzus persicae (Sulzer)	green peach aphid	vegetables, tobacco
61	Acyrthosiphon pisum (Harris)	pea aphid	peas, alfalfa
38	Macrosiphum euphorbiae (Thomas)	potato aphid	potato, tomato, rose
37	Aphis gossypii Glover	melon aphid, cotton aphid	watermelon, canteloup
37	Rhopalosiphum maidis (Fitch)	corn leaf aphid	corn
20	Tuberolachnus salignus Gmelin	giant willow aphid	willow
18	Brachycaudus persicae (Passerini)	black peach aphid	peach
14	Macrosiphum avenae (Fabricius)	English grain aphid	wheat, barley
14	Schizaphis graminum (Rondani)	greenbug	oats, wheat
13	Anuraphis maidiradicis (Forbes)	corn root aphid	corn, aster
13	Cinara strobi (Fitch)	white pine aphid	white pine
13	Macrosiphum liriodendri (Monell)	tuliptree aphid	tuliptree, magnolia

T.L.B., 3909 Beechwood Road, Hyattsville, Md. 20782

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Ed. note: The book notice on the following page was sent in by Eugene J. Gerberg, Ph.D., R.P.E.

THREE MICRO MOTHS (GELECHIOIDEA) UTILIZING THE DEAD ELM NICHE

Robert S. Bryant

My observations on the insect life associated with dead elm trees (Bryant, 1977) began when I started removing the limbs from the last three of our stately old patriarchs to prevent wind-fall damage. Since beginning that project in 1973, I have noticed many species of micro-lepidoptera resting on the bark and hiding in cracks and fissures. With my very limited knowledge of the habits and life histories of the majority of the micros, I assumed that the moths I had seen were passing the daylight hours on a fairly safe, cryptic and uneven surface waiting for night to fall. But, upon closer observation and study, it now appears that at least three of the more conspicuous and showy species actually have a closer association with the dead elm tree than merely using it for a resting place.

The least attractive of this trio is Eido trimaculella (Fitch). It has the peculiar habit of resting with the head tilted downward, in the manner of an Anopheles mosquito; and because the moths are nearly black with whitish patches, they are difficult to see against the elm bark until they move. The larvae have been recorded as feeding on bracket fungi on dead birch (Hodges, 1974), and there is also apparently one record from elm. We have no birch (dead or otherwise) in the immediate vicinity, but the dead elm supports a wide variety of fungi throughout the season. I have collected the moths between 13 May and 14 June.

Though seldom seen on elm bark, Mathildana newmanella (Clemens) is never far from it. The adults boldly stroll around on the upper and lower leaf surfaces of maple saplings that have sprung up around our old elm trees. The moths are jet black with two orange chevrons at the bases of their forewings, and from their actions one might think they enjoy immunity from predation as many other similarly colored lepidoptera do. Larvae have been found under the bark of elm and apple (Hodges, 1974), and I have had adults of both newmanella and trimaculella eclose in the house in the middle of winter, apparently from elm logs brought in for the fireplace. Normal collection dates are from 30 May to 23 June.

The third moth, Callima argenticinctella Clemens, is by far the prettiest. It is brown and yellow with delicate lines of iridescent black and white scales and black and white banded legs. Hodges reports that the larvae have been found under elm bark but I have been unable to locate the daytime resting place of the adults even though they were abundant at UV light during 1980. Collection dates range from 9 June to 6 August, indicating a possibility of two broods.

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Bryant, R.S. 1977. Dead Elm Trees - A Microhabitat for a Great Variety of Insects. Maryland Entomologist. Vol.1 No.1 pp.2-6.

Hodges, Ronald W. in Dominick, R.B., et al., 1974. The Moths of America North of Mexico. Fasc. 6.2, Gelechioidea:Oecophoridae (in part)

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BOOK NOTICE

ANIMAL LIFE OF THE GALAPOGOS. 1980. by Norman Hicklin. Feredune Books, Oxon, England. 236 pp. $15.00

Dr. Hicklin has the unique facility of expressing himself verbally or in writing, in a manner to interest and delight the reader (or listener). His descriptions and drawings of the animal life of these "enchanted islands" are simply but adequately stated. There are 84 black and white drawings, in his inimitable scratch-board style. Dr. Hicklin not only describes the animal life, but points out key identification features in non-technical terms, and tells where the animals are found on the islands. It is interesting to find out how many orders of insects have not been found on these islands. Only 8 species of butterflies and 192 species of beetles have been reported.

For anyone planning a trip to the Galapogos, this is a guide book that one should not be without. In addition, there is a chapter on "notes for the visitor" detailing the climate, weather, accommodations, travel, passport requirements, clothing and other pertinent bits of information.

I, A BUTTERFLY

I have often wondered why
Must I be a butterfly?
Gaudy wings dipping toward the flame,
Playing just a flirting game,
Often singed, but never burned,
Chancing not on being spurned.

Sipping tiny little sips
Of nectar from a flower's lips,
Never quaffing to the full,
Denying depth's demanding pull.
Flitting always gaily by
What am I? A butterfly.

Don't even care to really fly;
Rather to simply flutter by,
Afraid to light, lest I might miss
A tender smile, a baby's kiss
Or fail to dry a childlike tear
Guess that's the reason I am here.

My chosen path is only true
Demanding naught from any who
Choose to soar to greater glory
This is my own, my happy story.
So, wish me well, as flitting by,
I wish you well -- a butterfly.

Mary Garber Secoy
(received for publication - 3/19/81)

Ed. note: One of those little glitches, that make an editor's job interesting, occurred when the above poem was received. After detecting what, to my mind, was an inaccurate statement the poem was returned to the author with the suggestion that the reference to "the flame" be omitted, since butterflies are not known to possess a proclivity for such things. In due course, a revised version was submitted but not corrected, merely appended. Having reviewed my options, I present herewith the following addition for your amusement or amazement.

EPILOGUE TO - I, A BUTTERFLY

How crude of me to think that I
Could ever be a butterfly.
I was as happy as I could be
Til Entomology slipped a net on me.
I didn't know they were standing by
To say I was not a butterfly.

They say a lowly moth am I
Who cannot be a butterfly,
That dipping at flames isn't right
'Cause butterflies don't fly at night--
That I have made a tactical error
And am simply not a rhopalocera.

A Lepidopteran they will let me be
If I approach on bended knee.
So, Entomology, for what it's worth to you
I apologize at least a time or two
Dipping my wings, sailing gaily by.
To me, I'm still a butterfly!

Mary Garber Secoy - 6/4/81
(Entomology is a journal of the MES)

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The Maryland Entomologist is published irregularly by the Maryland Entomological Society. Original articles on geographic and temporal distribution, particularly pertaining to Maryland and adjacent states, ecology, biology, morphology, genetics, systematics, behavior, etc. are welcome. Book notices and reviews, news of the members, requests for information, notes on distribution, occurrence, migration, life history and others will be published. All articles are subject to editorial review and acceptance. They should be sent to Robert S. Bryant, 522 Old Orchard Road, Baltimore, Maryland 21229.

This publication will reflect the interests, views, and talents of the entire membership. It will be viable as long as everyone views his contributions as necessary and meaningful for its continuance.

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NOTICE TO CONTRIBUTORS

Contributors should prepare manuscripts according to the following instructions.

Text: Manuscripts should be submitted in triplicate, and must be typewritten, entirely double-spaced, employing wide margins, on one side only of 8½ X 11 inch paper. The first mention of a plant or animal in the text should include the full scientific name, with authors of zoological names. Underline only where italics are intended. Short articles and general notes are preferred, up to a maximum of twelve pages. Longer manuscripts, if accepted, will be assessed page charges.

Literature Cited: References in the text to articles or books should be given as, Villiard (1964) or (Villiard, 1964, 1969) and all must be listed alphabetically under the heading LITERATURE CITED, as follows:

Villiard, P., 1964. Multicolored World of Caterpillars. Natural History Vol.LXXIII No.4 p.24-31

_____. 1969. Moths and How to Rear Them. Funk & Wagnalls, New York. 235pp.

Additional references that may be helpful to the reader, and not to exceed six in number, should be listed under the heading SELECTED REFERENCECES, in the above manner.

Tables: Tables, graphs and line drawings should be done with indelible, black ink and should be placed on separate sheets, following the main text, with the approximate desired position indicated in the text.

Illustrations: Photographs may be accepted if they are necessary to support the text. Reproduction of photographs may increase the printing cost and authors should expect to pay any extra charges. Photographs should be approximately 2½ X 3½ inches, if depicting single specimens, and not larger than 5 X 7 inches for groups of specimens. They must be black and white, glossy finish and mounted with frosted tape, wax, or rubber cement to an extra sheet of paper. Figure numbers, as cited in the text, and figure legends should be typewritten below each photograph.

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Past Presidents of the M.E.S.

Austin P. Platt - 1971-1973
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William A. Andersen - 1975-1977
Robert T. Mitchell - 1977-1978
Elaine R. Hodges - 1978-1979
Richard H. Smith, Jr. - 1979-1980

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